

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

**In the Matter of**

**Review of the Emergency Alert System  
296**

**EB Docket No. 04-**

**This is a Response to FCC 05-191  
First Report and Order & Further Notice )  
of Proposed Rulemaking )**

**Filed on December 23, 2005 by Kenneth Putkovich**

**Introduction**

I am an engineer with graduate certification in telecommunications and information technology. I recently retired from the Federal Government with over 45 years of experience in engineering and engineering management in the fields of emergency warning, international broadcasting, metrology (not meteorology), and instrumentation and measurement in both the public and private sector. The last 17 years of my career were spent in the emergency warning field at the NOAA National Weather Service (NWS) on the NOAA Weather Radio (NWR) and Weather Wire Service (NWWS) Programs. I am submitting these comments as a private citizen.

**Executive Summary**

This filing is intended to better define emergency warning and highlight and dispel widely held misconceptions about emergency warning in the United States. It proposes utilizing enhanced technology and infrastructure of the NOAA National Weather Service, that is currently operational, as the backbone for a National Emergency Warning System (NEWS). This approach provides the most cost effective way to implement the reliable, accessible, secure, public sector, infrastructure necessary to support the many “new technology” private sector systems being proposed for multi-media, timely, end point delivery of emergency messages to people immediately at risk. It describes a win-win approach for all stakeholders in

the effort to create means to more effectively deliver emergency warnings to all people at risk.

The National Alert System (NAS) described in the Warning, Alert, Response Network (WARN) Act of 2005 has been approved and funded in the Deficit Reduction Act of 2005 passed by both Houses of Congress in the last two weeks. The NAS described in the WARN Act is largely operational as part of the NOAA NWS infrastructure and could provide all the required capabilities described with limited, previously demonstrated, proven enhancements to existing systems. This would build on the current, highly effective, successful efforts of the NOAA NWS in delivering severe weather warnings and accommodate and expand these capabilities to better serve the All-Hazard needs of the emergency management communities, the public, and all people with disabilities. Improving the collection and delivery of emergency warnings by using existent, multimedia NOAA NWS systems, would provide ubiquitous, low cost, immediate access to all emergency warnings from everywhere to everywhere. At the same time, it would provide any private sector “new technology” system (cell phone, pager, Internet, Email, EAS, DTV, DAB, digital cable, DBS, SDARS, HSD DTV, etc.) wanting to provide long sought after, cost-effective, multi-media emergency warning delivery to those specifically at risk with a direct, low cost source for those warnings messages.

### **General Comments**

I am totally dismayed by the First Report and Order and Further Notice of Proposed Rulemaking (FCC 05-191) released on November 10, 2005. It appears to me that there continues to be a gross misunderstanding at best and misrepresentation at worst regarding the current state of emergency warning needs and capabilities in the United States. The disparity between my analysis and interpretation of Comments submitted on Docket EB 04-296 in November 2004 (Attachment 1) and the interpretation presented in the current FCC 05-191 concerns me. The problems inherent in the Emergency Alert System (EAS) have been well documented. The Federal Communications Commission (FCC) allowed the EAS program to slip into a moribund state, providing little or no funding or human resources to support it. The creation of the Department of Homeland Security (DHS) resurrected interest in EAS as a vehicle for emergency warnings and has allowed and encouraged efforts to develop “new technology” for more effective emergency warning that has brought little focus to the fundamental issues of effective warning delivery. The efforts to resurrect a failed EAS described in this NPRM are the result.

The National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service (NWS) mounted a highly successful ten year effort to expand the reach and effectiveness of its emergency warning systems to better meet mission requirements of providing emergency warnings to the public. NOAA NWS has a unique emergency warning infrastructure that is nowhere else available. Unfortunately, NOAA and NOAA NWS have failed to seize the initiative and provide the desperately needed Federal leadership required to meet the need for more a more effective National Emergency Warning System (NEWS) for collection and delivery of emergency warnings. Strong leadership and a relatively small amount of funding is needed to enhance the operation of existing NOAA NWS systems and revolutionize the collection and delivery of emergency warnings to meet the needs of all emergency warning stakeholders. Unfortunately there continues to be little interest or support at NOAA for efforts to implement these proposed, successfully demonstrated enhancements or to complete the planned expansion effort. Current resources to sustain existing operations are marginal.

A significant, widespread lack of a core understanding of emergency warning processes and capabilities exists. Unfortunately, it exists throughout most management levels of the Federal Government agencies involved in emergency warning. One need only attend any of the many recent conferences or read the many reports addressing emergency warning issues to observe the confusion that exists. This, coupled with profit motivated efforts of private sector parties intent on marketing solutions to solve these rather ill-defined “problems,” has resulted in a confusing number of off-axis issues being created that are detrimental to planning and implementing more effective emergency warning message delivery to people immediately at risk. An attempt to bring some clarity to this critical issue is provided in Attachment 2.

The primary objective of efforts in emergency warning is to deliver emergency messages in a timely, effective manner to those who are immediately at risk of death or injury from a natural or man-made disaster. A secondary objective is to reduce economic harm caused by these disasters. An effective and timely National Emergency Warning System (NEWS) must be able to collect National, Regional, State, and Local emergency messages from authoritative sources anywhere in the United States and deliver them to those specifically at risk anywhere in the United States under existent conditions in affected area for “short fused” events, where the time between a warning being issued and event occurrence is measured in seconds. These events include tornados, flash floods, earthquakes, tsunamis from local earthquakes, toxic releases, terrorist activities, and myriad other events. Emergency information dissemination for “long fused” emergency events such

as hurricanes, winter storms, flooding, wildfires, etc. and non-emergency events such as school closings, traffic problems, etc. can generally be adequately served by existing media and local public and private safety and emergency management systems, but may utilize the NEWS where resultant “short fused” situations develop or when other systems are inoperative during and after an event.

Another key issue that is poorly understood and not well addressed is the ability to provide effective and timely emergency warnings to people with disabilities. There are over 40 million people in the United States with disabilities that require special accommodations to provide viable access to effective emergency warnings. A NEWS must be able to accommodate the needs of people with disabilities as effectively as it does for those people without disabilities.

Several points need to be made at this juncture:

The allegation that there is no effective emergency warning system in the United States is totally false. The NOAA National Weather Service has been operating an effective National Emergency Warning System (NEWS) for years. It consists of 140 Weather Forecast Offices and Centers interconnected by several digital telecommunication networks, manned 24/7/365 by experienced emergency warning experts. It utilizes multiple systems, including NOAA Weather Radio All Hazards (NWR), which is capable of delivering emergency voice warnings directly to people at risk within less than a minute of issuance, and NOAA Weather Wire Service, which is capable of collecting and delivering emergency text warnings from anywhere to emergency managers and media anywhere in the United States in less than 10 seconds of issuance. These and other NOAA NWS systems are capable of delivering detailed text and graphic information over the Internet, Email, dedicated telephone lines, and satellite broadcasts in seconds to minutes. NOAA NWS NEWS has a documented track record of saving lives and a remarkable resiliency that not only assures survivability under extremely adverse conditions, but an unprecedented ability to be operational under circumstances where other telecommunications systems fail. This was dramatically illustrated during past and recent hurricanes including Katrina, Rita, and Wilma. In addition, it is the only source of reliable, effective emergency warnings accessible to people with disabilities – it can wake people who are deaf or blind for specific, selected events in specific locales with direct broadcasts into their homes, anywhere at anytime.

The Emergency Alert System (EAS) and its predecessors have never been used for the primary mission of a National level emergency warning issued by the President and has failed and is woefully inadequate for its secondary mission of providing emergency warnings to the public. The reasons have been well documented by the Partnership for Public Warning and many others, including comments submitted previously for this NPRM. The voluntary nature of EAS for emergency warnings other than a Presidentially declared emergency, the potential cost to broadcasters of making broadcasts mandatory, the complexity and cumbersome nature of the EAS State/Local hierarchy, the lack of Federal support for EAS and myriad other problems have doomed EAS to failure. Unfortunately, the proposals, to fix EAS using a digital satellite network to replace the existing structure, will not solve the underlying weaknesses (latency, emergency manager access, public availability, etc.) that make EAS untenable for effective emergency warning delivery.

With few exceptions, proposals to develop and implement a new national emergency warning capability based on “new technology” only address “last mile” or “endpoint” delivery of emergency messages. The premise is that a single source or delivery mechanism is not adequate and that emergency messages need to be delivered on cell phones, Internet, pagers, Blackberries, digital radio and TV, etc., so that recipients can be convinced by receiving multiple warnings. However, unless the messages received convey nearly the same information and are from a credible, authoritative source, multiple messages with varying content can be counter-productive. One need only observe local TV stations during the period of an NWS issued severe weather warning. In Washington, DC for example, local broadcasts on each of the four major network affiliates may or may not include a “crawl” generated from emergency warnings issued by NWS – either directly via NOAA Weather Radio or NOAA Weather Wire Service or via an EAS (rarely is EAS activated and a true EAS warning be issued) message triggered by NWS broadcasts. In any case, the emergency event will likely be a part of special news or weather programming done by news and weather staff at the local affiliate. In this highly competitive environment, predictions, and interpretations can vary widely as in-house meteorologists and news people compete with other stations and the NOAA NWS for the most accurate prediction or exclusive coverage “bragging rights.” One might also observe the problems with live, closed captioning for emergencies – where often unintelligible captioning may hide the emergency message crawl or where there may be no captioning at all. Three stations were recently

fined by the FCC for not providing required captioning for audio emergency warning broadcasts..

Since there are no existing networks and infrastructure for collecting and delivering emergency warnings, other than those in NOAA NWS, a “new technology” solution for emergency warning collection and delivery would have to be able to provide services equal to the anywhere, everywhere, all-the-time capabilities that NOAA NWS NEWS provides. The few, viable “new technology” solutions that have been proposed have price tags in excess of \$200 million, would require more than 3 years to implement, require significant annual recurring costs for operation and maintenance, and offer little more than current services provided by NOAA NWS NEWS. Those not-so-viable, proposed solutions, based and dependent on public terrestrial network telecommunications and the Internet, suffer from numerous vulnerabilities that were highlighted by the extensive communications failures experienced during recent hurricanes.

## **NOAA NWS NEWS**

Over the past ten years NOAA NWS NEWS, particularly NWR, has been expanded and enhanced with Congressional appropriations, a partnership with the U.S. Department of Agriculture, and numerous other public/private partnerships championed by many individuals and organizations who realize its great value to the public. NOAA NWS NEWS is currently being upgraded and enhanced to further improve and expand coverage and performance. The following improvements to NOAA NWS NEWS systems and infrastructure have been completed or are in progress:

1. NWR coverage has been expanded to include over 97% of the United States population including Alaska, Hawaii, Puerto Rico, and former Pacific Trust territories using state-of-the-art systems. More expansion to cover additional poorly served “high risk” and rural areas is in progress.
2. NWR has a National Public Alert™ technical performance Standard (CEA-2009) and a certification program for NWR receivers. This was a joint effort between NOAA, the Consumer Electronics Association, and Environment Canada.
3. The Departments of Commerce (DOC), Education (DOE), and Homeland Security (DHS) are engaged in a cooperative effort to provide Public Alert (NWR) receivers to every school in the United States.
4. NOAA and DHS have developed and will be doing an Operational Acceptance Test for HazCollect. HazCollect will provide timely,

secure, authenticated, electronic access for any Federal, Regional, State or Local emergency management organization authorized to issue emergency warnings for broadcast on NOAA NWS NEWS.

5. NWWS includes a direct, two-way link to the National Law Enforcement Telecommunications Systems (NLETS) for exchange of emergency messages between NOAA NWS and several hundred thousand local NLETS users.
6. NWWS provides 50 satellite downlinks to State Emergency Operations Centers, has 400 commercial subscribers in the emergency management and mass media communities, and provides emergency warnings via Internet and Email.
7. There are two-way NWWS satellite links at all NWS Centers for Environmental Protection (Tropical Prediction, Storm Prediction, Aviation Weather, Alaska Tsunami Center, Pacific Tsunami Center), the National Earthquake Center, and NWS Headquarters; and a terrestrial link to the Space Environment Center for collection of All-Hazard environmentally related warnings.
8. The expansion of NWWS is being explored, with the possible addition of over 100 two-way satellite uplinks at coastal WFOs. This was proposed and funded in the wake of the uninterrupted performance of the NWWS two-way satellite terminal at the NOAA NWS Weather Forecast Office/River Forecast Center at Slidell, LA and other NWWS nodes in the area during Katrina, Rita, and Wilma.
9. Work is in progress on an RFP to upgrade NWR Stations with state-of-the-art transmitters at 400 NWR locations that were placed in operation prior to 1995, many in the late 1970s.
10. Work is in progress on an RFP for the Weather Radio Improvement Program (WRIP). This effort includes previously demonstrated system enhancements that not only improve system performance, but also provide timely, everywhere access to digital text and voice emergency messages to enable emergency warning delivery by any viable “new technology” end point delivery system. Improvements include:
  - a. replacement of the existing, aging broadcast console systems,
  - b. elimination of single points of failure in WFO to NWR station telecommunication links by replacing terrestrial telephone lines with satellite links,
  - c. placement of satellite links at all WFOs,
  - d. improved access for State and local emergency management community,
  - e. improved system monitoring,
  - f. implementation of sub-carrier text broadcasting for the deaf and hard of hearing, and

- g. better system integration to improve performance, operations, and maintenance.
- 11. Work is in progress to eliminate single points of failure at NWR stations due to inadequate emergency power.
- 12. Work is in progress to utilize the OASIS Common Alerting Protocol (CAP) for formatting NOAA NWS NEWS emergency warnings.
- 13. Work is in progress on HazCollect, a joint NOAA NWS and DHS venture to provide timely, secure access to NOAA NWS NEWS to everyone authorized to issue All-Hazard emergency warnings.
- 14. NWWS and NWR emergency warnings are geo-target to specific areas through the NWR SAME FIPS based coding and through NWWS UGC FIPS based coding. NWWS warning messages have been enhanced to include All-Hazard areas at risk defined by graphical polygons defined by a set of geodetic coordinates contained in the NWWS message. These can be extracted by other end point delivery systems to provide more precisely targeted emergency warning delivery.
- 15. NWWS text emergency warnings can be broadcast in any language, requiring only an acceptable foreign language message template and a source capable and authorized to issue foreign language warnings. NWR now has Spanish NWR broadcast stations and several stations that broadcast in both Spanish and English. Broadcasting live and recorded voice and text broadcasts on NWR and NWWS is not a problem where multi-lingual staff is in place. Foreign language text-to-speech NWR broadcasts require special, high-quality translation application programs not currently available.
- 16. An NWWS two-way satellite terminal could be placed at any location (White House, DHS/FEMA Operations Center, State EOCs, etc.) to provide instant access to NOAA NWS NEWS. Portable NWWS two-way satellite terminals could be pre-positioned at locations for deployment to disaster sites to provide post event emergency services.
- 17. Public Alert™ certified receivers are currently available from three major manufacturers, with several other manufacturers poised to market Public Alert™ devices. Plans are in progress to incorporate the outstanding AlertGuard television technology developed by Thomson (RCA) into HDTV systems for sale in 2007.

The Canadian Weather Radio Network is also being upgraded, enhanced, and expanded to include NOAA NWR SAME technology. They are also testing the text broadcast capability developed by Hy-Tek, LLC for NOAA NWS NWR as a result of a DOC/NOAA Small Business Innovative Research



contract. This is significant since they broadcast on the same frequencies as NWR in a non-interfering basis to Public Alert receivers. The two systems complement each other, providing more comprehensive coverage to those on both sides of the border.

Given these circumstances, what capabilities and advantages could one expect from the enhanced NOAA NWS NEWS described?

The NOAA NWS NEWS will be a multimedia, Government operated, private telecommunications network able to reliably deliver All-Hazard text and audio emergency warnings from any authorized source anywhere in the U.S. to those people immediately at risk in a specific area anywhere in the U.S. in less than a minute under extremely adverse environmental condition, 24/7/365.

The public has direct access to NEWS using currently available, low cost Public Alert <sup>TM</sup> receiver technology.

All nodes in the NOAA NWS NEWS would be in secure facilities staffed by trained Government professionals experienced in dealing with emergency situations 24/7/365.

Emergency warnings would be immediately available in a digital CAP format for immediate, targeted redistribution by any end point provider using any available “new technology.”

Emergency managers would have direct, instant, seamless access to NOAA NWS NEWS broadcasting into their area of responsibility

The ubiquitous availability of digital text and voice via NWWS, NWR and other “new technology” would enable:

1. Multi-lingual delivery using any available, suitable translation application software.
2. Store and forward applications in instances where people at risk may not be immediately available to hear the live broadcast,
3. Potential use of commercial radio and television sub-carrier and digital equivalents to automate direct output of delivered digital voice and text using SAP and Text capabilities in existing systems or Text sub-channels in DTV systems.
4. A considerable reduction in the need to provide captioning and video description to meet the needs of people with disabilities. The availability of both text and speech from enhanced, low cost Public Alert<sup>TM</sup> certified devices would be an immediate solution to

providing a complete emergency warning capability to those people who are deaf, blind, hard of hearing, and those with vision problems. It would allow the development of tactile devices for people who are deaf and blind and other special devices that can better address the needs of people with more complex cognitive or physical disabilities.

There are a number of planned and potential future changes to the existing NOAA NWS NEWS that would further enhance performance and utility:

1. The replacement of existing WFO to NWR station terrestrial, wireline telephone links with satellite links and the placement of satellite terminals at all WFOs would immediately revolutionize and improve NOAA NWS NEWS ability to deliver emergency warnings. It makes each node in the NOAA NWS NEWS part of a mesh network, allowing each node to be addressed from any other node while providing a conduit for a digitized stream of individual voice and text messages. Since each message contains elements that identify specific events, specific locations, and sources, the message stream can be parsed by a receiver for event and location specific messages applicable to the area of interest to the user.
2. The 1/9<sup>th</sup> county granularity of the NWR SAME/FIPS coding is viewed by some as limiting in the sense that some events require a more area specific warning targeted to a much smaller area. The 1/9<sup>th</sup> level in NWR, coupled with the co-ordinate defined “storm box” polygons and UGC/FIPS codes in NWWS are probably adequate for NOAA NWS emergency warnings in the foreseeable future. Less than 10,000 of the 1 million mathematical combinations possible with the six-digit NWR SAME code are currently in use. Since Public Alert <sup>TM</sup> devices can respond to any of the one million codes, the potential exists to more narrowly define warning areas in a number of high risk All-Hazard areas. The potential may also exist for future software changes that would expand NWR SAME from numeric to alphanumeric, raising the maximum number of possible geo-codes from  $10^6$  (1 million) to  $36^6$  (over 2 billion) for non-weather, All-Hazard warnings.
3. In the existing EAS, the current ENDECS can capture the NOAA NWS NWR SAME information and automatically broadcast it as the audio of the station broadcast. Because this interrupts programming in progress, this is rarely done. However, what if that audio stream, and in the future a text sub-carrier, was captured and put on the SAP and Text sub-channels of existing NTSC broadcasts or their equivalents in DTV? The relatively inexpensive NWR SAME decoding technology currently used in

Public Alert™ receivers (in fact current Public Alert devices might themselves be modified) to process this output from slightly modified radio and television receivers to extract full text and voice NWR emergency warning broadcasts. Since this involves no interruption to ongoing programming, it might allow the full potential of EAS to be realized in a way acceptable to broadcasters and with minimal modifications to transmission and receiver technology.

4. The protocols, approved user databases, authentication procedures and technology developed in the NOAA/DHS HazCollect partnership could be utilized at the local NOAA NWS WFO and State and Local EOC levels to provide the secure local access to NOAA NWS infrastructure desired by the emergency management communities.
5. The NOAA NWS is currently seeking the design of a “smart” Public Alert device that would use GPS technology, on-board NWR databases and NWR SAME coding, and algorithms to allow an NWR receiver to automatically determine its position and program itself to set both the NWR frequency and FIPS codes for its location. This would provide people that travel and those in automobiles, boats, airplanes, motorcycles, or hiking with timely, “hands off” emergency warnings at their current location.
6. If future “new technology” that might provide a low cost alternative to the NWR broadcast network emerges, it could be seamlessly integrated into the fabric of the NOAA NWS NEWS and allow NWR to be phased out.

## **Recommendations**

This being the case the following recommendations are made;

Government and private sector efforts should be concentrated on building out the existing NOAA NWS NEWS to better meet all needs for public emergency warning. The requirements for changes to EAS as suggested in this NPRM need to be evaluated on the basis of a NEWS built on NOAA NWS infrastructure and limited to those areas where EAS can be an effective secondary conduit for emergency warnings from an enhanced NOAA NWS NEWS. Continued efforts to use EAS as a primary vehicle for the delivery of emergency warnings should be discontinued. Instead EAS should be viewed as an adjunct to an enhanced NOAA NWS NEWS and only changes

necessary to take full advantage of existing links to NOAA NWS NEWS pursued.

Pursuing new technology solutions to provide a National Emergency Warning System or to somehow revitalize the failed EAS is a waste of money and resources when the infrastructure and technology in place at NOAA NWS can do the job better, faster, and at less cost.

Some funded modifications to the NOAA NWS NEWS are currently under way. The estimated 2003 cost of \$70 million for implementing NEWS on NOAA NWS infrastructure is now around \$45 million. The modifications successfully demonstrated for NOAA NWS NEWS in the 2004 NAWN effort could be completed in less than two years, would result in direct annual savings of about \$3 million dollars per year in operation and maintenance costs, and would provide access to effective emergency warnings for people with disabilities. NOAA and NOAA NWS need to step up to the challenge and take the lead in efforts to establish a more effective NEWS on NOAA NWS infrastructure.

### **Specific Comments on NPRM**

This First Report and Order and Further Notice of Proposed Rulemaking (FRONPRM) is based on the questionable assumption that the FCC Emergency Alert System (EAS) is an effective public emergency warning system that only requires some adjustments to make it work better. It is not. While there might be a statutory requirement for a system for delivering National level warnings and a case made for an effort to extend and improve that capability on the existing EAS, efforts for extending and expanding the system to meet state and local emergency warning delivery simply can't be justified. Support for such an expansion and enhancement in Comments submitted in 2004 in response to 04-296 is cited as justification for this FRONPRM. Unfortunately, it appears that dissenting Comments and those that clearly indicated strong opposition to EAS were largely ignored and not given any consideration in the deliberations.

Applying "new" technology to the existing, flawed EAS implementation is not going to make it work more effectively. Replacing the hierarchical PEP structure with a satellite network would certainly improve things at the front end, but as long as delivering non-National emergency warnings to people at risk with EAS is voluntary, disruptive to commercial programming, and in competition with the broadcast media news and weather services, it will not be an effective primary vehicle for delivering emergency warnings to people

immediately at risk. In any case there is a satellite and infrastructure (NWWS) in place that can do the job.

**Paragraphs 1 to 15** – Provide EAS background, history, and recent events regarding EAS. I find it incredible that NOAA is mentioned only in passing as a player in this arena in spite of the fact that the NOAA National Weather Service (NWS) is the only Federal agency with public warning specifically in its mission statement. NOAA NWS has an effective National Emergency Warning System (NEWS) that has been in operation for many years; that has a demonstrated, documented history of saving lives; and that is the primary source of emergency warnings for EAS activation. NOAA NWS capabilities were cited a number of times in the Comments submitted in response to the 2004 NPRM.

**Paragraphs 16 to 18** – Seeks to make a case for implementing EAS on DTV, DAB, DBS, SDARS, and digital cable at “...some level of basic national or regional warning,” by integrating “...sophisticated services and features of digital media at an early developmental stage.” in the belief that “...the current EAS is overall the most effective way to provide such a basic level warning...” In truth, the EAS isn’t effective now and extending it under existing regulations to the digital media is not going to make it any more effective for basic regional and local warning.

Digital media are way beyond an early developmental stage! Integrating emergency warning capabilities into current digital media technology will require extensive, expensive retrofits. However, emergency warning capabilities could be included into any next generation designs and device production, but will require a real return on investment for manufacturers to make that happen. In the interim, making use of existing, available capabilities for multimedia, end point delivery of emergency messages seems to be the only viable alternative! This requires an infrastructure for collection and dissemination of emergency warnings that is only available at NOAA NWS.

**Paragraphs 19 to 59** – Describes the details of the Report and Order, including the rationale and how, when and why EAS is required to be implemented on DTV, DAB, digital cable, DBS, SDARS and why HSD is excluded from the requirement. Since these media do offer a potentially valuable conduit for delivering emergency warnings to people at risk, means other than those implemented in the current EAS (which is acknowledged as a failure) need to be explored before imposing an onerous system (EAS), that has not lived up to aspirations in the analog world, on the digital world. I believe that the existing investment in EAS and its extension to the digital media required by this Rule and Order can be useful in the end point delivery of emergency warnings to the public, but not as presently implemented and

not in a primary role. Enabling the NOAA NWS NEWS as described in other parts of this Comment would provide anywhere, all-the-time collection and delivery of emergency warnings from all sources in digital standard formats. It would fulfill statutory National requirements for an emergency warning system that would allow the President to directly address over 97% of the United States population, provide the same capability to Regional, State, and local emergency managers, and meet the needs of people with disabilities. Commercial broadcasting has multiple ways of carrying digital information to users using sub-carriers or sub-channels (SAP, RDBS, Captioning, Text, etc.). It should be relatively simple to use existing EAS technology to recover digitized text and voice emergency warnings from the upgraded NOAA NWS NEWS and pass them through current broadcast processes to slightly modified, currently available broadcast receivers for processing by Public Alert™ capable devices. We know that NWR broadcasts were routinely broadcast on SAP and as the local audio for local weather radar displays on cable. Could an EAS ENDEC output serve as an input to SAP? Could a text emergency warning recovered from the proposed NWR text sub-carrier by an EAS ENDEC be injected as Text or Closed Captioning? If they could, EAS could serve as an un-intrusive (from the broadcaster's standpoint) vehicle for delivery of geo-targeted emergency warnings to those at risk.

**Paragraph 60** - States that "Further we amend our EAS rules to insure that persons with disabilities have equal access to public warnings." Where in the Report and Order is this described? The two major communities of people with disabilities are those who are deaf or hard of hearing and those who are blind or with low vision. Neither the current EAS nor that anticipated by this Rule and Order meet access requirements for these communities. Audio is useless to people that can't hear and video is useless to people who can't see. EAS is rarely activated in commercial broadcasting, the preference being for station news and weather staff to interrupt scheduled programming with their interpretation of the event or to use a video "crawl" generated by station personnel, which may or may not be accompanied by Closed Captioning (CC). With EAS, the deaf and hard of hearing are left with what they might see on television, if they happen to be watching when the station decides to provide a warning. They could see graphics or video of the event, but get none of the detailed information provided in the audio monologue, unless it has live Closed Captioning or has a text crawl. Unfortunately, current CC is often unintelligible or hidden behind or hiding the crawl. Access to public warnings for the deaf and hard of hearing with EAS is marginal at best. Those who have problems seeing are limited to what information may be present in television audio (if they happen to be "watching TV" (unlikely) unless the program is "described," which few live broadcasts are. Public alerts via radio can be useful to people who have vision problems, but they have to be listening at the time the public alert is

broadcast. Currently, NWR serves both these communities, the blind more completely than the deaf, with timely, 24/7/365 service that can wake them for local emergency events anywhere in the United States.

**Paragraph 61** – The current EAS can be improved to serve a useful secondary role in delivering emergency messages to the public, but not in a primary role – there are just too many negatives that mitigate against that in both the existing implementation and that envisioned for digital systems.

**Paragraph 62** – I fully agree with the need for a public alert and warning system as described in this paragraph. Much of it currently exists and is operational in the existing NOAA NWS NEWS, which will be significantly improved by current and planned enhancements.

**Paragraph 63** – Most of the proffered approaches address end point delivery systems that require secure, reliable infrastructure for the ubiquitous collection of emergency warnings from authenticated sources and ubiquitous delivery to all available end point delivery systems for further dissemination by all available media. The described NOAA NWS NEWS currently does this, including end point delivery systems that provide emergency warnings to other endpoint delivery systems such as EAS, Emergencyemail.org, and Thundereagle's WE400 service. Proposed enhancements would significantly improve this process, open the door to simple voluntary, un-intrusive implementation on any communications technology or system, and eliminate the need for complex Federal regulations and mandatory requirements. The consumer and the marketplace would determine what services and systems are viable.

**Paragraph 64** – I agree with this viewpoint.

**Paragraph 65** – Most of the proposed solutions require a supporting infrastructure to supply timely, authenticated emergency warnings for further dissemination. There are only a few organizations authorized to issue emergency warnings within any jurisdiction. This is true at National, Regional, and local levels, i.e. the President, the National Weather Service for weather, the National Earthquake Center, Alaska and Pacific Tsunami Centers, Governors /State Emergency Operations Centers, Mayors/City Operations Centers, etc. In some cases at local and sometimes State or Regional levels, the infrastructure is available and the proposed systems would and do work well. In other cases, the infrastructure is not there and many of the proposed solutions are not viable. The Commission should allow consumers and the market place to decide and make the choices as to what solution meets their needs.

**Paragraph 66** – Again, all the submitted suggestions have a potential role in a future emergency warning system for the United States. What most of them lack is a clear vision of the infrastructure required to make the system work. The FEMA Digital Emergency Alert System and the ASPTS proposal for use of the PBS satellite system may provide viable solutions to specific EAS deficiencies and solve some local/regional problems, but where is the infrastructure needed to implement a 24/7/365 National capability to collect and disseminate emergency warnings from authorized sources anywhere and immediately deliver them to those at risk? The only place it is currently operationally available is at NOAA NWS. A viable emergency warning network infrastructure can't rely on public telecommunications services that are subject to interruptions due to overload, that don't function well under environmental stress, or that are vulnerable to casual or intentional disruption. That points to a private satellite network designed specifically for and dedicated to emergency warning integrated with a closely held, dedicated, distributed end point delivery system. Such infrastructure and systems have been in continuous operation by the NOAA NWS for over 20 years and have saved thousands of lives.

**Paragraph 67** – There are a number of issues concerning a common protocol for emergency warning. Although a common emergency warning protocol like CAP, which is really an emergency message format template or standard, rather than a communications protocol, simplifies the seamless collection and delivery of emergency warnings. Common message formats and templates simplify interoperability for end point providers, but they are not absolutely necessary. Conversion between formats used by various systems and creation of custom formats for special applications has become much simpler with microprocessors. The NOAA NWS established and refined emergency warning message protocols and formats; established policies, procedures, and standards defining the creation and issuance of emergency messages; and dealt with the issues involved in transitioning among systems and processes with different message formats. NOAA NWS developed and implemented Specific Area Message Encoding on NWR that was adopted by EAS, and is in the process of testing CAP for possible application in NOAA NWS systems. NWWS accommodates both World Meteorological Organization (WMO) and NOAA NWS Product Identifier Listing (PIL) message formats in NWWS. Each NWWS warning message contains geographic coordinates for a geo-targeted polygon that outlines the area immediately at risk. There are a number of commercial end point delivery systems able to take the information formats broadcast on NWR and NWWS and convert them to emergency messages suitable for public delivery. Some even have very refined geo-targeting capabilities that can convert the polygon information in NWWS messages into very detailed geo-targeted delivery to limit overwarning.



**Paragraph 68** – The NOAA NWS NEWS I’ve described is intended to deliver all emergency messages received from all authorized sources anywhere in the United States to areas at risk anywhere in the United States by NWWS satellite broadcast as digital messages in less than tens seconds. These messages would have both digital audio and text components intended for broadcast on NWR and standard NWWS digital text broadcast. As previously noted, these messages currently contain specific event and specific area information to allow selection of only those messages of interest to and selected by the “listener.”

What if the “listener” is a telecommunication system/service provider that simply rebroadcasts the message as received on an inaudible sub-carrier or on a sub-channel on an analog or digital broadcast or as an Email on the Internet in the case of text? Or, what if it is provided as digital audio and text to a device capable of processing and outputting the message? Depending on the system architecture, the provider could process the message and direct it to those clients at risk or simply pass the message on to a device that would itself provide the message to a client’s device that would process the message.

This is actually being done today. I receive emergency warnings from two services that send me Emails derived from received emergency messages – one derived from NWWS and one derived from NWR broadcasts. I also receive an Emails from the commercial Email service provided under the NWWS contract for every All-Hazard emergency warning broadcast on NWWS from anywhere in the entire country. There are also set-top boxes for specially equipped cable systems that are triggered by NWR SAME broadcasts captured and retransmitted by the cable provider.

EAS is capable of automatic, live rebroadcasts of local NWR emergency broadcasts, but it rarely happens. There are no low-cost EAS receivers available that are capable of triggering alarms on information broadcast on EAS through commercial radio or television or television broadcasts or by cable.

There appear to be conduits available in current analog and digital telecommunication technologies to provide the relatively small bandwidth needed to convey emergency warnings to “listeners.” It appears that EAS activations from NOAA NWS NEWS could be channeled to SAP or Text Captioning services in current broadcast TV services and to similar channels in digital broadcast media, be it DTV, DTH, SDARS, RDBS, etc. These conduits could be used to carry NWR audio and text to listeners, without cumbersome and costly system modifications, using existing low cost

technology. We know NWR has been broadcast on the SAP channel by many broadcasters – could the same be possible for text using one of the dedicated close caption/text capabilities (C1, C2, C3, C4, T1, T2, T3, & T4) on current TV receivers? Could existing EAS ENDECS be used to do this? Could the same thing be done on DTV sub-channels? Are there SDARS sub-channels or some bandwidth on a dedicated channel that could be used to simply pass a digital audio/text warning (much like existing technology that allows these broadcasts to be rebroadcast to standard FM receivers in vehicles) to a programmed Public Alert™ device that alarms only for the specific areas and events desired and ignores all others? Could the back channels proposed for emergency warnings on cellular phones or the text Email capabilities in both cell phones and Blackberry type devices be used to provide geo-targeted text warnings to phones or devices within a single cell?

It appears that there may be a number of ways of providing both text and voice emergency warnings on existing media, that are less costly, less intrusive and disruptive, and more effective than the existing EAS concept of voluntary, interrupted broadcasts.

**Paragraph 69** – See Paragraph 68 – existing wireless technology and devices appear to have enough capabilities to provide adequate emergency warning - there should not be a need to replace existing handsets. On the other hand, the relatively short life span and recurring replacement of cellular handsets due to the continued rapid growth in cellular technology and service would allow new technology to be integrated into a new handset without placing an undue burden on consumers.

**Paragraph 70** - Within the limitations imposed by existing, embedded wireline technology, that currently precludes timely, simultaneous distribution of emergency messages to large numbers of people because of switching limitations, wireline technology should be required to participate in emergency warning to the extent possible.

**Paragraph 71** – There is a significant amount of duplication of effort by diverse groups to develop a more effective National Emergency Warning System. There has been little done to coordinate these efforts. Two, earlier Executive Office Working Groups were followed by the Public Partnership for Warning, which is now being followed by another White House Working Group. Somewhere during this chronology the FCC EAS program went moribund and was resurrected. The Media Security and Reliability Council (MSRC) was created and added to the mix. The National Council on Disabilities; the Deaf and Hard of Hearing Consumer Advocacy Network; the Interagency Coordinating Committee of the Department of Homeland Security; the Office of Disability Employment Policy in the Department of

Labor; and the NCAM/WGHB Access Alert Project funded under a DOC grant have or are addressing emergency warnings for people with disabilities and are producing copious amounts of similar information on the subject. In the past year, conferences were held by DHS/FEMA - the “Integrated Public Alert Warning System (IPAWS) Conference,” by GSA – the “Interagency Disability Educational Awareness Showcase (IDEAS)” Conference, by Gallaudet University - the “Accessible Emergency Notification and Communications: State of the Art” Conference, and ANSI/HSSP/NIST – the “Workshop on Standardization for Emergency Communications.” The United States Senate Committee on Commerce, Science and Technology has reported out the Warning, Alert, Response Network Act (S. 1753) seeking to establish a National Alert System and both Houses of Congress voted to fund the effort in the Deficit Reduction Act of 2005 passed on December 21, 2005. A caucus of organizations and Government agencies dealing with emergency management and disabilities presented a public, open Congressional briefing on Capitol Hill. There are a number of Government funded demonstrations and pilot programs by private sector organizations to market “new technology.”

It appears that little is being done to coordinate these efforts. Perhaps the FCC could play a role in improving coordination on these critical issues, perhaps DHS could fund a more coordinated effort, and perhaps NOAA could step up and make a concerted, unambiguous effort to offer the NOAA NWS infrastructure as the backbone for a more effective NEWS.

**Paragraph 72** – There are existing standards that assure timely delivery of accurate emergency warning messages by the existing NOAA NWS NEWS. Messages are accepted only from authenticated sources. NWWS does no message processing other than checking that messages are intact, of a type approved for broadcast, and are not duplicates. NWWS has contractually stipulated delivery delays, operational availabilities, and environmental performance metrics to guarantee delivery to users that are the de facto standards and performance metrics for emergency warning collection and delivery. Procedural and service back-up systems are in place to mitigate system failures. NWR has established operational performance metrics dealing with system failures, has redundant components in many critical subsystems, has defined standard specifications for equipment, has performance monitoring capabilities, and has a CEA approved Standard for receiving devices. The proposed NOAA NWS NEWS would further improve performance metrics by eliminating current single points of failure, improving system monitoring, implementing CAP, and revolutionizing emergency warning delivery by integrating existing networks into a full mesh, digital network architecture with all nodes being addressable and able to communicate with all other nodes.

**Paragraph 73** – Realistically, use of EAS by state and local emergency managers requires direct access to broadcast media to be effective. Both commercial and Government broadcasters are reluctant to allow emergency managers to seize control of broadcast facilities for emergency broadcasts and have instituted policies and procedures that severely limit this mode of operation. This resulted in EAS being voluntary for these broadcasts, access to broadcast facilities being available only through cumbersome manual processes, and the need for detailed plans and organizations to administer EAS at State and local levels. The proposed NOAA NWS NEWS with HazCollect would eliminate many of these barriers and provide immediate access to a single station, a subset of stations, or the entire NWR network by any emergency manager with authorized access as defined in pre-executed agreements. These messages could then be delivered to any endpoint delivery system, including EAS, with the knowledge that they are authentic and contain information to allow appropriate delivery to geo-targeted audiences.

**Paragraph 74** – Totally agree that emergency messages must be more accessible to people with disabilities. The proposed NOAA NWS NEWS would provide direct access to complete audio and text, All-Hazard emergency warnings.

**Paragraph 75** – No Comment

**Paragraph 76** - Current captioning technology for live broadcasts suffers from numerous problems that make it problematic from the standpoint of delivering effective, timely emergency warnings to those with hearing related disabilities. There are significant, documented problems in the relatively straightforward process of delivering useful pre-recorded captioning services – one need only bring the subject up in a group of deaf or hard of hearing people to get an idea of how poor captioning can be. Effective live captioning is much more difficult to deliver, requiring the services of a competent, professional captioning service; real time communications among the source of the warning message, the captioning service, and the broadcast station; and staff at the station to make sure the captioning is actually being broadcast. A failure of any of these typically results in unintelligible captioning or no captioning being broadcast. Trained steno-typists capable of live captioning are in short supply. Quality assurance for captioning at minimally staffed broadcast stations is virtually non-existent. Broadcasters seem reluctant to using available, automated captioning technology. Station personnel seem unable to provide the monitoring necessary to assure high quality, uninterrupted captioning. The problems are numerous and viable solutions few.

**Paragraphs 77 - 78** – The proposed NOAA NWS NEWS would provide emergency warnings in both text and audio to other end point delivery systems in a single digital message stream via satellite. The NOAA/DHS HazCollect system will provide state and local messages to the NWR that could be broadcast as both voice and text.

**Paragraph 79** – Given the text and aural capabilities of the proposed, upgraded NOAA NWS NEWS, both digital text and audio message formats would be available to anyone for processing into products that could meet the needs of people with disabilities without placing additional burdens on broadcast media and service providers.

The existing Public Alert™ technology provides adequate alarming capabilities for most events and disabilities. Public Alert™ can wake and warn the deaf and hard of hearing and those people with vision problems and other disabilities. The audio broadcasts provide detailed warning information for those with vision disabilities and limited information for people with hearing related disabilities. The proposed addition of text to the NWR broadcast would supply the more detailed information required by people with a hearing loss.

**Paragraph 80** – The NOAA NWS NWR and Public Alert™ are the only currently available, effective means for warning people with disabilities. The NOAA NWS NEWS provides an extension of this capability by providing full text capabilities on publicly available broadcasts. NOAA NWS NEWS would also enable a number of existing technologies to be better used to provide timely emergency information directly to people with disabilities. The fundamental problems that exist in the implementation of EAS and closed captioning for delivering emergency warnings to people in general and specifically to people with disabilities are not easily resolved, as is detailed in NPRMs in those two areas.

**Paragraph 81** – NWR has two Spanish-only broadcast stations and several other stations that broadcast in English and Spanish. The Canadian Weather Radio Service, available along the northern U.S. border, broadcasts in French and English. Multilingual emergency warning messaging is available in some Public Alert™ devices driven by NWR. This is a difficult issue to resolve in non-emergency situations due to the amount of broadcast time needed for replicated, multilingual broadcasts in situations where the broadcast cycle time is limited and where large amounts of information have to be accurately translated. It also becomes an issue when a “short-fused” warning needs to be translated into another language prior to broadcast. It is less of an issue in situations where a station or media are dedicated to

broadcasting in a language other than English or when Public Alert™ technology is used.

## **Attachment 1**

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### **Review of Comments on FCC NPRM 04-296 submitted November 29, 2004**

The Federal Communications Commission (FCC) sought comments on a Notice of Proposed Rulemaking (NPRM) in the matter of the Emergency Alert System (EAS), Docket EB 04-296, during a 60 day period ending on October 29, 2004. Although the subject of the NPRM was the Emergency Alert System, comment on the much broader topic of National emergency warning was requested. It has been reported that the response to this NPRM was the second largest in FCC history.

I reviewed all comments submitted on the NPRM. I found that my comments, submitted on October 29, were validated by nearly all the other comments submitted.

There were 101 individual submissions made by 26 Associations, 29 companies, 27 government entities, and 19 individuals during the comment period. These numbers are the result of my personal analysis and classification. The following comments are the result of a quick review and are not meant to be a rigorous analytical treatise.

The Associations included radio and TV broadcasters (12), disability (4), telecommunications (2), cellular/wireless (3), cable (2), missing children (1), public warning (1), and electronic trade (1). The companies included radio and TV broadcasters (9), warning equipment manufacturers (8), companies with emergency warning interests (7), satellite radio broadcasters (2), telephone (1), and cable (1). Government entities included city/town/municipal (11), Regional/ State (8), county (6) and Federal (2). Of the 19 comments from individuals, 2 were concerned with disability issues.

There was nearly unanimous agreement that (1) the current EAS doesn't work very well, (2) the EAS serves a useful purpose and should be fixed, (3) a single Government department should be responsible for national emergency

warning matters, and (4) the Department of Homeland Security/Federal Emergency Management Agency was a logical choice.

More specific comments on particular aspects of the EAS NPRM are as follows:

The focus of comments from all city and some county emergency management was almost exclusively centered on a single issue of retaining access to cable TV as a means for delivering local emergency information to their constituents through pre-emptive access to programming being delivered by a local cable franchise.

Broadcasters are universally opposed to local emergency managers being able to seize control of local broadcast transmitters for emergency broadcasts and to override local cable delivery of their broadcasts using EAS.

Those individuals and associations that commented on the delivery of emergency information to people with disabilities emphasized that nearly all existing emergency warning delivery systems are woefully inadequate despite existing regulations to the contrary. Audio EAS delivery is useless to deaf and hard of hearing people. Captioning on TV is, in many cases, poor quality, sporadic, missing, or behind a crawl (a crawl many also be behind captioning). For the blind, captioning, crawls and pretty graphics are useless and detailed voice descriptions are usually absent or inadequate. NOAA Weather Radio was identified as an exception to this situation.

“New technology” cellular end point providers proposed and lobbied for greater use of cellular technology in emergency warning. Cellular and telephone associations and companies cautioned against using these technologies for trying to provide timely emergency warnings to large numbers of people as existing systems were not designed for nor capable of point to multipoint delivery. They also pointed out that enabling technologies for cellular broadcast of emergency warnings were not currently widely deployed.

It is also quite instructive to note the dichotomy that exists in the broadcast industry comments. On one hand the cost and effort of participating in EAS is too great because NWS issues too many warnings, emergency warning pre-emption of broadcast programming by the cable industry is too disruptive of programming, emergency management direct access to broadcast facilities can not be allowed, testing and record keeping are too onerous, etc. On the other hand



there seems to be millions of dollars available for private weather radar and staff meteorologists who preempt programming for hours, giving minute by minute progress reports of a thunderstorm or putting a reporter at risk by putting him on the shore in the dark during a hurricane. It seems somewhat self-serving to claim EAS activation for an event is not necessary, to then spend hundreds of thousands of dollars in covering the event as news, and then this as a public service.

Three individual submissions expressed opinions that EAS is an outmoded nuisance and should be eliminated. Others observed that with all the new technology available there must be a better way of doing things

Most comments to the NPRM relate to efforts focused on end point delivery of emergency warnings. In general, there appears to be little understanding or interest in the need for and structure of a National emergency warning system.

Just as many end-point delivery system providers use NOAA Weather Radio performance as the metric by which they judge the performance of their systems superior, a similar circumstance is occurring in forecasting local weather events that become news events. In many major metropolitan areas broadcasters have made considerable investments in weather radars, meteorologists, mobile telecommunications, and staff. There are increasing claims that they provide more accurate and timely local emergency warning delivery to the public than NWS and EAS. While this is true in some cases because of their ability to concentrate all their attention on a small local area, the fact that most of the information on which these forecasts are based is supplied either directly or indirectly by the NWS is largely ignored and goes unreported.

Comment to the EAS NPRM reaffirms the need for an emergency warning system that can meet the needs of the public, the public safety and emergency management communities, and people with disabilities. It is also quite clear to me from the comments to the NPRM from the broadcast industry, that although EAS can be of some future use as an emergency warning end point provider, it will never function in the role of a primary public emergency warnings system. It is also apparent that there is also no universal consensus for viable, “new technology” alternatives, i.e., cellular telephone, satellite broadcasts, wireline telephones, Internet, cable, etc., that are often mentioned as candidate platforms for an emergency warning system.

It is also clear that there is very little understanding of the NOAA NWS infrastructure that currently supports an operational National emergency warning system. This is due, in large part, to the universal, narrow focus on NOAA Weather Radio (NWR) in the wider context of National emergency warning. NWR like EAS is an end-point emergency warning delivery system. EAS is largely dependent on NWR for warning information and NWR is largely dependent on NWS infrastructure for that information. Neither EAS nor NWR, in isolation, is a suitable platform for a National warning system.

I and several others who submitted comments to the NPRM identified the existing NWS infrastructure as a viable platform for the needed National Emergency Warning System. With proposed refinements and upgrades, it would provide a state-of-the-art platform for the collecting text and voice emergency warnings from anywhere in the United States and delivering them everywhere in the United States in less than a minute. It would provide effective access to the entire emergency management community for direct input of emergency warnings and to the entire emergency warning user community for timely warning delivery. It would use existing, available consumer products. It would support the implementation of the proposed “new technology” end point delivery systems. It would free those currently involved in trying to make the current EAS function to resolve the conflicting issues that exist between cable operators, broadcasters, and local governments. It would enable more effective use of the EAS. It would resolve many of the emergency warning problems being experienced by people with disabilities. It would be implemented on an existing, publicly owned infrastructure in a short period of time at a relatively small cost that would yield a significant return on investment. It would revolutionize the collection and delivery of emergency warnings.

Based on comments received as a result of the NPRM, I recommend that the FCC, DHS/FEMA, and NOAA join in an effort to use the existing NOAA NWS infrastructure as the backbone for a National Emergency Warnings System by integrating NWR and NOAA Weather Wire Service (NWWS); by making timely, local, electronic access available to emergency managers; by completing the proposed and ongoing build-out and enhancement of NWR; and by better integrating NWS infrastructure with other emergency warning technologies, both existing and proposed.

## **Attachment 2**

### **Emergency Warning and Dissemination Systems**

**Prepared May 24, 2005**

**Ken Putkovich**

There are distinct differences between dissemination systems and emergency warning systems that must be well understood by those involved in building, operating, and using these systems. While all emergency warnings systems are dissemination systems, not all dissemination systems are emergency warning systems.

Emergency warning systems need to convey concise, effective messages that can be easily understood, to diverse audiences immediately at risk. They need to be carried quickly and directly from those authorized to generate warning messages to those most immediately at risk. This must be reliably done in a minimum amount of time regardless of situational circumstances (severe weather, damaged infrastructure, high stress levels, personal safety, etc.) at the source of the emergency warning or in the area at risk. Over the past two decades, NOAA NWS spent billions of dollars to advance the state of the art in forecasting in order to gain minutes of lead-time in predicting severe weather events. Those gains can't be squandered by dissemination systems that waste seconds and minutes in delivering emergency messages over numerous, convoluted links or by systems that rely on delivery mechanisms that may not be available when needed. Emergency warning systems need to deliver specific information directly to people in specific areas at risk. Emergency warning systems need to be un-intrusive during non-emergency periods, yet be able to wake a deaf person in the middle of the night during an emergency. Emergency warnings systems can't tolerate an outage due to bad weather, can't have an antenna stowed during high winds, or can't be relegated to a restoration queue with other customers after an outage.

Effective emergency warning requires systems specifically designed for and dedicated to emergency warning delivery. While an emergency warning system may be used for other purposes during non-emergency periods, a system built for non-emergency purposes will not necessarily be effective in a secondary role of delivering emergency messages. This means that a warning provider or source must have quick, secure access to the system at any time; that the message transport system must be able to quickly convey the warning from the source to those at risk regardless of circumstances (weather, time-of-day, availability of public commercial power or communications, etc.) at the source, at the area at risk and points in between; and that the end-point delivery mechanism of the emergency warning system must be able to convey the emergency message to everyone at risk regardless of circumstance.

That means that a deaf person on the North Shore of Kauai, that is without utilities due to an ongoing tropical storm on Thanksgiving should be able to

receive a Tsunami Warning from the Pacific Tsunami Warning Center in Honolulu; that a mother busy tending to her children in Brunswick, Maryland should be able to receive a warning from local emergency managers about a toxic chemical spill and fire at the rail yard during flash flooding of the Potomac River on Mother's Day; or that people sheltered in a school gymnasium in Punta Gorda, Florida due to a hurricane should be able to receive a tornado warning on July 4.

It is highly likely that those people at risk, local emergency managers and public safety officials responsible for their safety, and the media in the area will get a timely warning message from NOAA NWS emergency warning systems (NWR and NWWS). It is much less likely that other dissemination systems that are currently being promoted as solutions to the problem of emergency warning delivery to people with disabilities, i.e., systems utilizing the Internet, text Email, cell phones, landline phones, or the Emergency Alert System on commercial radio, TV and cable would be able to deliver timely, effective emergency warnings under the conditions and situations described. The technologies are viable, but they lack the means to economically collect, process, and deliver emergency warnings in a seamless, timely manner from authenticated sources directly to those at risk

An effective emergency warning system has to be built on a closely held, tightly controlled infrastructure whose primary purpose is delivering emergency messages. It cannot be built on telecommunications intended for public access, with service subject to failure due to environmental conditions or heavy traffic loading on holidays or during local emergencies. Nor can the system rely on unattended operations or extended links that add complexity and delay to the collection, processing, and delivery of emergency warnings. It must be able to activate an attention getting alarm. It must deliver a message that can be understood by those at risk, regardless of immediate or personal circumstance, with enough information and time to allow immediate, effective mitigating action by those at risk. Seconds lost due to system delays, failures, or indecision can translate into lives lost.

These concepts were articulated in "Effective Disaster Warnings" published in November 2000. Available dissemination systems were also researched and discussed in the report. The only effective operational emergency warning capabilities identified as available to the public were those that are part of the NOAA NWS infrastructure. Little has changed in the interim. Many thousands of dollars and countless hours of effort have been spent in trying to identify "new technology" systems for emergency warnings. Many "new technology" end point delivery systems are being identified as possible solutions for emergency warning delivery, but the fact remains that, other than NOAA NWS systems and infrastructure, no existing or planned

emergency warning infrastructure or networks have been identified that could serve as the backbone for a National Emergency Warning System.

NOAA NWS infrastructure and systems remain as the only viable means to effectively warn people at risk due to natural and man-made All Hazard disaster situations. They have a demonstrated, documented history of saving lives. These emergency warning systems are in place, operational, and Federally owned, as is the critical infrastructure (secure facilities, trained staff, and state of the art telecommunication and information technology systems) supporting their operation. Efforts should be focused on changes to these NOAA NWS systems that will eliminate current weaknesses and enhance their capabilities. In doing so, the value of all existing and proposed “new technology” end point delivery systems will be significantly enhanced. However, we must make sure, that in the process, NOAA NWS systems are not inadvertently changed and allowed to regress from emergency warning systems to dissemination systems. At a minimum, current performance levels must be maintained.